

WHAT IS CLAIMED IS:

1. A method comprising:
 - determining a beat-to-beat variability in cardiac electrical activity;
 - determining a relevance of the variability to one of atrial fibrillation and atrial flutter
 - 5 using a non-linear statistics;
 - identifying one of an atrial fibrillation event and an atrial flutter event based on the determined relevance, the event being a period in time when the information content of the cardiac electrical activity is of increased relevance.
- 10 2. The method of claim 1, further comprising identifying the end of the event based on the determined relevance.
3. The method of claim 1, further comprising transitioning into an event state associated with atrial fibrillation in response to identification of the event.
4. The method of claim 1, further comprising transmitting the event to a remote receiver from an ambulatory patient.
- 15 5. The method of claim 1, wherein determining the relevance of the variability to atrial fibrillation comprises:
 - receiving information identifying a ventricular beat; and
 - assigning a preset value indicating that the variability is negatively indicative of atrial fibrillation.
- 20 6. The method of claim 5, further comprising identifying a ventricular tachycardia event based at least in part on the information identifying the ventricular beat.
7. The method of claim 1, wherein determining the relevance of the variability to atrial fibrillation comprises determining an average relevance of variability in a collection of R to R intervals.
- 25 8. The method of claim 1, wherein determining the beat-to-beat variability comprises determining the beat-to-beat variability in a series of successive beats.

9. The method of claim 8, wherein determining the beat-to-beat variability in a series of successive beats comprises determining the variability in an interval between successive R-waves.
10. The method of claim 1, wherein identifying the event comprises comparing the relevance
5 of the variability to a first predetermined amount of relevance.
11. The method of claim 10, further comprising comparing the relevance of the variability in the event to a second predetermined amount of relevance to identify the end of the event, the second predetermined amount being lower than the first predetermined amount.
12. A method comprising:
10 collecting information describing the variability in heart rate over a series of beats;
 designating variability at a lower end of physiological values as being largely
 irrelevant to atrial fibrillation;
 designating variability in a midrange of physiological values as being indicative of
 atrial fibrillation;
15 designating variability in an upper range of physiological values as being negatively
 indicative of atrial fibrillation; and
 determining a relevance of the variability described in the collection to atrial
 fibrillation.
13. The method of claim 12, wherein designating the variability comprises multiplying the
20 information describing the variability by a weighting factor.
14. The method of claim 12, wherein collecting the information comprises collecting
information describing a variability in R to R intervals over a series of beats.
15. The method of claim 14, wherein collecting the information describing the variability
comprises collecting information that is a function of a ratio of a first R to R interval and
25 an immediately preceding R to R interval.

16. The method of claim 15, wherein collecting the information describing the variability comprises collecting information related to factor DRR(n) as given by

$$DRR(n) = ABS\left(\frac{RR(n, n-1)}{RR(n, n-1) + RR(n-1, n-2)} - \frac{1}{2}\right).$$

17. The method of claim 16, wherein designating the variability at the lower end of physiological values as being largely irrelevant comprises designating information related to factors DRR(n) less than about 0.02 as being largely irrelevant.

18. The method of claim 16, wherein designating the variability at the midrange of physiological values as being indicative of atrial fibrillation comprises designating information related to factors DRR(n) greater than about 0.02 and less than about 0.15 as being indicative of atrial fibrillation.

19. The method of claim 16, wherein designating the variability at the upper range of physiological values as being negatively indicative of atrial fibrillation comprises designating information related to factors DRR(n) greater than about 0.157 as being negatively indicative of atrial fibrillation.

20. The method of claim 12, wherein collecting the information describing the variability comprises collecting the variability in heart rate over a series of between 20 and 200 of the recent R to R intervals.

21. The method of claim 12, wherein determining the relevance of the variability comprises determining the relevance of the variability to sustained atrial fibrillation.

22. The method of claim 12, wherein the series of R to R intervals is a continuous series of R to R intervals.

23. A method comprising:

comparing recent R to R intervals with preceding R to R intervals to yield a collection of comparisons;

weighting the comparisons according to a likelihood that the comparisons are relevant to atrial fibrillation, the weighting including

identifying a first of the recent beats as a ventricular beat, and
assigning a preset value to weight the first beat in the collection, the preset
value being negatively indicative of atrial fibrillation; and
determining the average relevance of the collection to atrial fibrillation.

5 24. The method of claim 23, wherein weighting the comparisons comprises:

designating variability at a lower end of physiological values as being largely
irrelevant to atrial fibrillation; and

designating variability in a midrange of physiological values as being indicative of
atrial fibrillation.

10 25. The method of claim 23, wherein weighting the comparisons comprises designating
variability in an upper range of physiological values as being negatively indicative of
atrial fibrillation.

26. The method of claim 23, further comprising identifying a ventricular tachycardia event
based at least in part on the identification of the ventricular beat.

15 27. The method of claim 23, wherein comparing comprises comparing recent R to R intervals
with immediately preceding R to R intervals to yield a collection of comparisons.